Abstract Submitted for the MAR07 Meeting of The American Physical Society

The Study of Temperature Dependence and High Temperature Operation of Photoresponse in Superlattice Infrared Photodetectors SHIH-HUNG LIN, J.H. LU, C.H. KUAN, J.Y. FENG, T.S. LAY, DEPARTMENT OF EE,NATIONAL TAIWAN UNIVERSITY TEAM, GIEOE, NATIONAL SUN YAT-SEN UNIVERSITY TEAM — For temperature dependence of photoresponse in superlattice with a single barrier, we have compared two samples' performance and concluded four factors are in effect including doping density in superlattice, externally applied bias, the single barrier's thickness and energy height. Doping density and temperature will change electron distribution in the first miniband of superlattice, and thereby the photoresponse. Scattering during the transport through barrier is increased with applied bias. Barrier thickness and height influence ballistic transport behavior and tunneling mechanism, respectively. Based on these factors, we design a structure of superlattice integrated with quantum wells to demonstrate photoresponse under high-temperature operation. By understanding those factors' effect, it is advantageous to design SLIPs for high-T applications.

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Date submitted: 15 Dec 2006

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